



State of Idaho
Department of Environmental Quality
Air Quality Division

**AIR QUALITY PERMIT
STATEMENT OF BASIS**

Permit to Construct No. P-2008.0038

Final

Fuels Reduction Services, LLC

Portable

Facility ID No. 777-00428

December 17, 2008

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Senior Air Quality Engineer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01. et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

Table of Contents

ACRONYMS, UNITS AND CHEMICAL NOMENCLATURE	3
1. FACILITY INFORMATION.....	4
2. APPLICATION SCOPE AND APPLICATION CHRONOLOGY.....	4
3. TECHNICAL ANALYSIS	4
4. REGULATORY REVIEW	7
5. PERMIT FEES.....	10
6. PUBLIC COMMENT	11
APPENDIX A – AIRS INFORMATION	
APPENDIX B – RESERVED	
APPENDIX C – AMBIENT AIR QUALITY IMPACT ANALYSIS	
APPENDIX D – FACILITY COMMENTS	

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable ambient concentration for non-carcinogens
AACC	acceptable ambient concentration for carcinogens
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
FRS	Fuels Reduction Services, LLC
HAP	Hazardous Air Pollutant
hp	horsepower
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
lb/T	pounds per ton
MACT	Maximum Achievable Control Technology
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
MMBtu	million British thermal units
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NSPS	New Source Performance Standards
PC	permit condition
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	Synthetic minor
SO ₂	sulfur dioxide
SO _x	sulfur oxides
TAP	Toxic Air Pollutant
T2	Tier II operating permit
T2/PTC	Tier II operating permit and permit to construct
T/yr	tons per year
UTM	Universal Transverse Mercator
VE	visible emissions
VOC	volatile organic compound

1. FACILITY INFORMATION

1.1 Facility Description

Fuels Reduction Services, LLC (FRS) has proposed to operate a portable air curtain burner/incinerator for disposing/burning untreated wood-waste or forest slash.

1.2 Permitting Action and Facility Permitting History

This is an initial permit to construct (PTC) for the portable air curtain burner/incinerator.

2. APPLICATION SCOPE AND APPLICATION CHRONOLOGY

2.1 Application Scope

The application is for a portable air curtain burner/incinerator. The applicant intends to use an air curtain burner/incinerator as a method of disposing/burning untreated wood-waste or forest slash, without the use of other forms of open burning or prescribed wild lands burning.

2.2 Application Chronology

March 10, 2008	DEQ received the application
April 7, 2008	DEQ declared the application incomplete
May 27, 2008	DEQ received application supplement
June 24, 2008	DEQ declared the application complete
August 21, 2008	DEQ issued draft permit for facility review
October 14, 2008	DEQ received facility's comments on draft permit
November 25, 2008	DEQ received PTC processing fee of \$5,000

3. TECHNICAL ANALYSIS

3.1 Emission Unit and Control Device

Table 3.1 EMISSION UNIT AND CONTROL DEVICE INFORMATION

Emission Unit /ID No.	Emissions Unit Description	Control Device Description	Emissions Discharge Point ID No. and/or Description
The portable air curtain burner/incinerator with associated diesel engine	The portable air curtain burner/incinerator consists of an above-ground refractory-lined firebox, an air curtain combustion air delivery system, and a 59-horsepower (hp) diesel-fired engine to power the air curtain. The portable air curtain burner/incinerator has a rated capacity of six tons per hour of untreated wood-waste or forest slash.	Air curtain powered by a diesel engine	A pipe is connected to the horizontal engine exhaust outlet. This pipe is routed into the incinerator firebox and the diesel engine's exhaust stream is combined with the incinerator's firebox exhaust stream.

3.2 Emissions Inventory

Emissions inventory details can be found in the application and application supplement. The following tables provide a summary of emissions from the facility.

Table 3.2 UNCONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS ^{a, b}

Emissions Unit	PM ₁₀ ^c		SO ₂		NO _x		CO		VOC		LEAD
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/quarter
Point Sources Affected by this Permitting Action											
Air curtain burner/incinerator, including emissions from diesel engine		209		NA		49.2 ^d		1,722		234	NA
Process Fugitive/Volume Sources Affected by this Permitting Action (not applicable)											

^a EFs used for uncontrolled emissions estimation are taken from AP-42 Section 2.5-Solid Waste Disposal, Table 2.5-5 (rev. 1/95)

^b NA= not available

^c As stated in footnote b of Table 2.5-5 of AP-42 Section 2.5 (rev. 1/95), "Particulate matter from most agricultural refuse burning has been found to be in the submicrometer size range." Therefore, PM = PM₁₀ is assumed. The applicant's assumption of 75% PM = PM₁₀ will not be accepted.

^d AP-42 EF of 0.0310 lb/hp-hr for NO_x was used in the application. If using NO_x emissions limit taken from 40 CFR 60 Subpart IIII for the 59-hp engine, which is 0.0152 lb/hp-hr, the emissions will be lower.

Table 3.3 CONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS (PTE)

Emissions Unit	PM ₁₀ ^c		SO ₂		NO _x		CO		VOC		LEAD	
	lb/hr max	T/yr ^b	lb/hr max	T/yr ^b	lb/hr max	T/yr ^b	lb/hr max	T/yr ^b	lb/hr max	T/yr ^b	lb/hr max	lb/quarter
Point Sources Affected by this Permitting Action (limited to 4,100 hr/yr)												
Air curtain burner/incinerator, including emissions from diesel engine	1.33	5.82	0.72	1.48	4.23 ^d	8.67 ^d	8.20	16.81	1.07	2.19	0.02	43.8 ^a
Process Fugitive/Volume Sources Affected by this Permitting Action (not applicable)												

^a 8,760 hr/4 x 0.02 lb/hr = 43.8 lb/quarter

^b T/yr = (lb/hr, max) x (4,100 T/yr) / (2000 lb/T)

^c As stated in footnote b of Table 2.5-5 of AP-42 Section 2.5 (rev. 1/95), "Particulate matter from most agricultural refuse burning has been found to be in the submicrometer size range." Therefore, PM = PM₁₀ is assumed. The applicant's assumption of 75%PM = PM₁₀ will not be accepted.

^d AP-42 EF of 0.0310 lb/hp-hr for NO_x was used in the application. If using NO_x emissions limit taken from 40 CFR 60 Subpart IIII for the 59-hp engine, which is 0.0152 lb/hp-hr, the emissions will be lower.

Table 3.4 CONTROLLED TAP AND HAP EMISSIONS SUMMARY (PTE)

TAPs	HAPs	Average time ^a	lb/hr
1,2-Dichloropropane		24-hour	1.78E-03
2,3,7,8-Tetrachlorodibenzo-p-dioxin	Yes	Annual	1.01E-10
2-Butanone (MEK)		24-hour	2.92E-04
2-Chlorophenol		24-hour	3.08E-06
Acetaldehyde	Yes	Annual	5.51E-03
Acetone		24-hour	1.03E-02
Acrolein	Yes	24-hour	5.41E-05
Arsenic	Yes	Annual	2.40E-04
Benzene	Yes	Annual	1.06E-01
Benzo (a) pyrene		Annual	1.90E-07
1,3-Butadiene		Annual	1.42E-04
Bromine		24-hour	2.34E-03
Cadmium	Yes	Annual	5.95E-05
Carbon tetrachloride	Yes	Annual	1.14E-03
Chlorine	Yes	24-hour	4.68E-02
Chlorobenzene	Yes	24-hour	1.78E-03
Chloroform	Yes	Annual	7.08E-04
Chromium	Yes	24-hour	9.36E-04
Chromium (VI)	Yes	Annual	1.29E-04
Cobalt	Yes	24-hour	7.80E-04
Copper		24-hour	2.24E-03
Crotonaldehyde		24-hour	5.35E-04
Ethylbenzene	Yes	24-hour	1.67E-03
Fluorene		24-hour	9.49E-06
Formaldehyde	Yes	Annual	2.32E-02
Hydrogen chloride		24-hour	1.03E+00
Iodine		24-hour	1.08E-04
Manganese	Yes	24-hour	7.56E-02
Mercury	Yes	24-hour	3.09E-05
Molybdenum		24-hour	1.14E-03
Naphthalene	Yes	24-hour	2.04E-02
Nickel	Yes	Annual	1.94E-04
PAH's as benzo(a)pyrene		Annual	5.43E-07
Phenol	Yes	24-hour	8.82E-04
Propionaldehyde	Yes	24-hour	3.29E-03
Selenium	Yes	24-hour	2.75E-04
Styrene	Yes	24-hour	1.03E-01
Tin		24-hour	1.86E-04
Toluene		24-hour	4.98E-02
Tungsten		24-hour	6.60E-05
Xylene	Yes	24-hour	1.44E-03
Zinc		24-hour	1.51E-02

^a 24-hour average applies to non-carcinogenic TAPs. Annual average applies to carcinogenic TAPs.

3.3 Ambient Air Quality Impact Analysis

Table 3.5 SIGNIFICANT IMPACT ANALYSES

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu\text{g}/\text{m}^3$) ^a	Significant Impact Level ($\mu\text{g}/\text{m}^3$)	Full Impact Analysis Required
PM ₁₀ ^{b, c}	24-hour	2.73 (2.05/0.75)	5.0	No
	Annual	0.25 (0.19/0.75)	1.0	No
Sulfur Dioxide (SO ₂)	3-hour	3.25	25	No
	24-hour	1.44	5	No
	Annual	0.29	1.0	No
Carbon Monoxide (CO)	1-hour	40.86	2,000	No
	8-hour	28.60	500	No
Nitrogen Dioxide (NO ₂)	Annual	0.79 ^d	1.0	No

^a Micrograms per cubic meter.

^b Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

^c As stated in footnote b of Table 2.5-5 of AP-42 Section 2.5 (rev. 1/95), "Particulate matter from most agricultural refuse burning has been found to be in the submicrometer size range." Therefore, PM = PM₁₀ is assumed. The applicant's assumption of 75%PM = PM₁₀ will not be accepted.

^d AP-42 EF of 0.0310 lb/hp-hr for NO_x was used in the application. If using NO_x emissions limit taken from 40 CFR 60 Subpart IIII for the 59-hp engine, which is 0.0152 lb/hp-hr, the impact will be less.

Table 3.6 FULL IMPACT ANALYSIS RESULTS FOR TAPS

Toxic Air Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu\text{g}/\text{m}^3$) ^a	AAC/AACC ^b ($\mu\text{g}/\text{m}^3$)	Percent of AAC/AACC
Non-carcinogenic TAPs				
Hydrogen Chloride	24-hour	5.12	375	1.4%
Manganese	24-hour	3.77E-01	50	0.8%
Carcinogenic TAPs				
Acetaldehyde	Annual	3.43E-03	4.50E-01	0.8%
Arsenic	Annual	1.49E-04	2.30E-04	64.8%
Benzene	Annual	6.62E-02	1.20E-01	55.2%
1, 3-Butadiene	Annual	8.85E-05	3.60E-03	2.5%
Cadmium	Annual	3.71E-05	5.60E-04	6.6%
Carbon tetrachloride	Annual	7.09E-04	6.70E-02	1.1%
Chloroform	Annual	4.41E-04	4.30E-02	1.0%
Chromium (+6)	Annual	8.05E-05	8.30E-05	97.0%
Formaldehyde	Annual	1.45E-02	7.70E-02	18.8%
Nickel	Annual	9.66E-04	4.20E-03	23.0%

^a Micrograms per cubic meter

^b Acceptable ambient concentration (AAC) for non-carcinogens/acceptable ambient concentration (AACC) for carcinogens

4. REGULATORY REVIEW

4.1 Attainment Designation (40 CFR 81.313)

The FRS air curtain burner/incinerator is a portable source that will operate state-wide. The air curtain burner/incinerator may locate in any area that is designated as an attainment or unclassifiable area for SO₂, NO₂, CO, lead, ozone, and PM₁₀.

The air curtain burner/incinerator may also locate in any PM₁₀ nonattainment area because facility-wide impacts were predicted to be below significant contribution levels.

The air curtain burner/incinerator may also operate in locations within 10 kilometers of a Class I area.

4.2 Permit to Construct (IDAPA 58.01.01.201)

The project does not qualify for an exemption in accordance with IDAPA 58.01.01.220. A PTC is required in accordance with IDAPA 58.01.01.201.

The portable air curtain burner/incinerator is a form of opening burning in accordance with IDAPA 58.01.01.006.73. It does not meet the definition of “incinerator” in accordance with IDAPA 58.01.01.006.055, therefore, emissions limit for incinerator in IDAPA 58.01.01.785 does not apply.

4.3 Tier II Operating Permit (IDAPA 58.01.01.401)

Not applicable.

4.4 Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

The facility is a synthetic minor source; therefore, is not subject to the Title V program.

4.5 PSD Classification (40 CFR 52.21)

The facility is a synthetic minor source; therefore, is not subject to the PSD program.

4.6 NSPS Applicability (40 CFR 60)

- 4.6.1 The facility is subject to 40 CFR 60 Subpart CCCC - Standards of Performance for Commercial and Industrial Solid Waste Incineration Units for Which Construction is Commenced After November 30, 1999 or for Which Modification or Reconstruction is Commenced After June 1, 2001.

The facility is subject to 40 CFR 60 Subpart A – General Provision.

The FRS air curtain burner/incinerator meets the definition of a new commercial and industrial solid waste incinerator under 40 CFR 60.2015. The FRS air curtain burner/incinerator is exempted from the majority of Subpart CCCC by 40 CFR 60.2020(i), and must only comply with the small subset of regulations for air curtain burner/incinerators contained under 40 CFR 60.2245-2260.

- 4.6.2 The 59-hp engine is subject to 40 CFR 60 Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines in accordance with 40 CFR 60.4200(a)(2)(i) because the 59-hp engine was manufactured in November, 2006 per August 18, 2008 email from FRS’s consultant.

4.7 NESHAP Applicability (40 CFR 61)

The facility is not subject to NESHAP.

4.8 MACT Applicability (40 CFR 63)

The facility is not subject to MACT.

4.9 CAM Applicability (40 CFR 64)

The facility is a synthetic minor source, and is therefore not subject to CAM.

4.10 Permit Conditions Review

This section describes the permit conditions for the initial permit.

- 4.10.1 Permit Condition (PC) 1.1 states the scope/purpose of this permitting action.

4.10.2 PC 1.2 includes information regarding regulated sources in the permit.

4.10.3 PCs 2.1 and 2.2 provide detailed descriptions of the portable air curtain burner/incinerator and its control.

4.10.4 PC 2.3.1 establishes controlled TAP emissions limits for Arsenic, Benzene, and Chromium (+6). These emissions limits are necessary to ensure that the impact of these TAPs from the portable air curtain burner/incinerator is below their respective AACC. Emissions of other pollutants from the portable air curtain burner/incinerator are inherently limited by these emissions limits.

To meet and demonstrate compliance with these limits,

- PC 2.5 limits the portable air curtain burner/incinerator operating hours to 4,100 hours per calendar year. PC 2.10 specifies the corresponding monitoring and recordkeeping requirements.
- PC 2.6 specifies the operating requirement of the portable air curtain burner/incinerator. PC 2.11 specifies the corresponding monitoring and recordkeeping requirements.
- PC 2.7 specifies the configuration of exhaust streams.
- PC 2.8 specifies the type of material that can be used in the portable air curtain burner/incinerator and the fuel type for the diesel engine.

4.10.5 PC 2.3.2 is process weight limit. At maximum rate of six tons of fresh slash per hour, the process weight limit is 11.5 lb/hr. The portable air curtain burner/incinerator, including the associated diesel engine, emits about 1.33 lb/hr at its maximum capacity when it is operated as designed (e.g., air curtain is working properly). The controlled emissions in the application are estimated using emissions factors obtained from source tests of similar equipment that were provided by the manufacturer.

To meet and demonstrate compliance with these limits,

- PC 2.6 specifies the operating requirement of the portable air curtain burner/incinerator. PC 2.11 specifies the corresponding monitoring and recordkeeping requirements.
- PC 2.8 specified the type of material can be used in portable air curtain burner/incinerator and fuel type for the diesel engine.

4.10.6 PC 2.4 includes a visible emissions (VE) limit in accordance with IDAPA 58.01.01.625.

To meet and demonstrate compliance with these limits,

- PC 2.6 specifies the operating requirement of the portable air curtain burner/incinerator. PC 2.11 specifies the corresponding monitoring and recordkeeping requirements.
- PC 2.8 specified the type of material can be used in portable air curtain burner/incinerator and fuel type for the diesel engine.
- PC 2.12 requires VE monitoring every 30 operating days in Idaho and recordkeeping.
- The requirements of 40 CFR 60 Subpart CCCC and Subpart A (i.e., PCs 2.18 through 2.23) also ensure that the portable air curtain burner/incinerator is in compliance with VE limit.

4.10.7 PC 2.9 states that the portable air curtain burner/incinerator is not permitted to collocate because the modeling analysis is based on operation of the portable air curtain burner/incinerator in the field without collocation of another emissions unit.

In IDAPA 58.01.01.006.35, emissions unit is defined as *“An identifiable piece of process equipment or other part of a facility which emits or may emit any air pollutant. This definition does not alter or affect the term “unit” for the purposes of 42 U.S.C. Sections 7651 through 7651o.”*

- 4.10.8 PC 2.13 states fuel sulfur content requirement and the corresponding monitoring and recordkeeping requirements.
- 4.10.9 PC 2.14 states fugitive control requirements and the corresponding monitoring and recordkeeping requirements.
- 4.10.10 PC 2.15 states requirements for odors and the corresponding monitoring and recordkeeping requirements in accordance with IDAPA 58.01.01.775-776
- 4.10.11 PC 2.16 states that the portable air curtain burner/incinerator is subject to air pollution emergency rules in accordance with IDAPA 58.01.01.550-562. The portable air curtain burner/incinerator is a form of opening burning in accordance with IDAPA 58.01.01.006.73.
- 4.10.12 PC 2.17 specifies the registration requirement for the portable air curtain burner/incinerator.
- 4.10.13 The portable air curtain burner/incinerator is subject to 40 CFR 60 Subpart CCCC as discussed in Section 4.6. PCs 2.19 through 2.22 are requirements taken from 40 CFR 60 Subpart CCCC that apply to the portable air curtain burner/incinerator.
- 4.10.14 PC 2.23 states that the portable air curtain burner/incinerator is subject to 40 CFR 60 Subpart A because it is subject to 40 CFR 60 Subpart CCCC.
- 4.10.15 The 59-hp engine is subject to 40 CFR 60 Subpart IIII as discussed in Section 4.6. PCs 2.25 through 2.30 are requirements taken from 40 CFR 60 Subpart IIII that apply to the 59-hp engine.
 - 40 CFR 60.4211(b)(4) is not an option because the 59-hp engine does not have a control device.
 - 40 CFR 60.7 does not apply because the 59-hp engine is not subject to 40 CFR 60.4214(a).
 - 40 CFR 60.8 does not apply because the 59-hp engine has a displacement of less than 30 liters per cylinder, and the performance test may not be an option due to its unique exhaust configuration.
 - 40 CFR 60.13 does not apply because the 59-hp engine has a displacement of less than 30 liters per cylinder.

5. PERMIT FEES

Table 5.1 lists the processing fee associated with this permitting action. The facility is subject to a processing fee of \$5,000 because its permitted emissions are greater than 10 tons per year and less than 100 tons per year. Refer to the chronology for fee receipt dates.

Table 5.1 PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO _x	8.67	0	8.67
SO ₂	1.48	0	1.48
CO	16.81	0	16.81
PM ₁₀ ¹	5.82	0	5.82
VOC ¹	2.19	0	2.19
HAPS ¹	1.13	0	1.13
Total:	36.11	0	36.11
Fee Due	\$ 5,000.00		

¹ Overlap may exist. However, it has no effect on the amount of process fee required.

6. PUBLIC COMMENT

An opportunity for public comment period on the PTC application was provided from March 18, 2008 to April 1, 2008 in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application, and there was no request for a public comment period on DEQ's proposed action.

Appendix A – AIRS Information

AIRS/AFS^a FACILITY-WIDE CLASSIFICATION^b DATA ENTRY FORM

Permittee/Facility Name Fuels Reduction Services L. L.C.
Facility Location: Portable
AIRS Number: 777-00428

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION ^c A-Attainment U-Unclassified N- Nonattainment
SO ₂	B							Portable
NO _x	B		x					Portable
CO	SM							Portable
PM ₁₀	SM		x					Portable
PT (Particulate)	B							
VOC	SM							Portable
THAP (Total HAPs)	B							
			APPLICABLE SUBPART					
			CCCC, III					

^a Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

^b AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

^c The burner is permitted to operate at any area in Idaho

Appendix B –Reserved

Appendix C – Ambient Air Quality Impact Analysis

MEMORANDUM

DATE: October 21, 2008

TO: Shawnee Chen, P.E., Permit Writer, Air Program

FROM: Darrin Mehr, Air Quality Analyst, Air Program

PROJECT NUMBER: P-2008.0038

SUBJECT: Modeling Demonstration for Fuels Reduction Services, Permit to Construct for a Portable Air Curtain Incinerator

1.0 SUMMARY

Fuels Reduction Services (FRS) submitted an application for a permit to construct on March 10, 2008. The application was declared incomplete on April 7, 2008. A response to the incompleteness letter was received on May 27, 2008.

This project consists of:

- An initial permit to construct for a portable air curtain incinerator within the state of Idaho;
- The incinerator is intended to burn untreated wood-waste or forest slash;
- The facility consists of an above-ground refractory-lined firebox, an air curtain combustion air delivery system, and a 59-horsepower diesel-fired engine to power the air curtain;
- The incinerator has a rated capacity of 6 tons per hour.

Emission rates are above de minimis thresholds for permitting applicability. Therefore, this project is subject to review under IDAPA 58.01.01.200. IDAPA 58.01.01.203.02 requires the facility to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). IDAPA 58.01.01.210 requires the facility to demonstrate compliance with the toxic air pollutants (TAPs) increments, which are listed in IDAPA 58.01.01.585 and 586.

Bison Engineering, Inc. (Bison) performed the ambient air dispersion modeling demonstration for this project on behalf of FRS. The modeling analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	Explanation/Consideration
Predicted impacts of PM ₁₀ were below the significant contribution levels of 5 µg/m ³ , 24-hour average and 1.0 µg/m ³ , annual average.	The portable facility may operate state-wide, including existing PM ₁₀ nonattainment areas
The permittee proposed an operational limitation to comply with carcinogenic toxic air pollutant (TAP) increments for arsenic, benzene, and hexavalent chromium. The method used to comply with IDAPA 58.01.01.210 was a controlled emission rate and controlled ambient concentration, per IDAPA 58.01.01.210.08.	The permit must include a limitation on the allowable hours of operation of 4,100 hours per calendar year. Operation of the source demonstrated compliance at 24 hours per day. No daily hours of operation limitation is necessary.
The facility consists of an air curtain incinerator. The blower for the incinerator is powered by a 59 horsepower diesel-fired engine. The standard manufacturer's design for the exhaust stack of this diesel-fired engine is a horizontal orientation approximately 0.5 feet from ground level. FRS will modify the engine exhaust by connecting a pipe to the horizontal exhaust outlet. This pipe will be routed into the incinerator firebox and the diesel engine's exhaust stream will be combined with the incinerator's exhaust stream.	Failure to orient the diesel exhaust to combine with the incinerator exhaust invalidates the modeling analysis for this project. Separate SCREEN3 runs for the incinerator unit and the diesel-fired engine would then need to be conducted. Downwash effects would also need to be accounted for with a ground-level horizontal release of the engine adjacent to the incinerator structure. The permit should include a requirement that the diesel-fired engine exhaust be modified as proposed
Per an August 6, 2008 email from Shawnee Chen, P.E., Permit Writer, the PM ₁₀ emission rate from the air curtain incinerator should be equal to the PM emission rate listed in the permit application. The emission factor for PM emissions is 0.20 pounds per ton of wood refuse incinerated. At the requested incinerator throughput of 6 tons per hour, the revised PM ₁₀ emission rate is 1.2 pounds per hour (lb/hr). The diesel engine PM ₁₀ emission rate is 0.13 lb/hr, for a total PM ₁₀ emission rate of 1.33 lb/hr. PM ₁₀ ambient impacts were revised to the following: <ul style="list-style-type: none"> • 2.65 micrograms per cubic meter (µg/m³), 24-hour average; and, • 0.25 µg/m³, annual average. 	PM ₁₀ 24-hour and annual averaging period impacts remain below the significant contribution levels. Additional modeling analyses and permit requirements are not required due to the increased PM ₁₀ emission rates for the incinerator.

2.0 BACKGROUND INFORMATION

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The FRS air curtain burner is a portable source that will operate state-wide. The FRS facility may locate in any area that is designated as an attainment or unclassifiable area for sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), lead (Pb), ozone (O₃), and particulate matter with an aerodynamic diameter less than or

equal to a nominal 10 micrometers (PM₁₀).

The FRS facility may also locate in any PM₁₀ nonattainment area because facility-wide impacts were predicted to be below significant contribution levels.

The facility may also operate in locations within 10 kilometers of a Class I area.

2.1.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.102, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

POLLUTANT	Averaging Period	Significant Contribution Levels^a (µg/m³)^b	Regulatory Limit^c (µg/m³)	Modeled Value Used^d
PM ₁₀ ^e	Annual	1.0	50 ^f	Maximum 1 st highest ^g
	24-hour	5.0	150 ^h	Maximum 6 th highest ⁱ
Carbon monoxide (CO)	8-hour	500	10,000 ^j	Maximum 2 nd highest ^g
	1-hour	2,000	40,000 ^j	Maximum 2 nd highest ^g
Sulfur Dioxide (SO ₂)	Annual	1.0	80 ^f	Maximum 1 st highest ^g
	24-hour	5	365 ^j	Maximum 2 nd highest ^g
	3-hour	25	1,300 ^j	Maximum 2 nd highest ^g
Nitrogen Dioxide (NO ₂)	Annual	1.0	100 ^f	Maximum 1 st highest ^g
Lead (Pb)	Quarterly	NA	1.5 ^h	Maximum 1 st highest ^g

^a IDAPA 58.01.01.006.102

^b Micrograms per cubic meter

^c IDAPA 58.01.01.577 for criteria pollutants

^d The maximum 1st highest modeled value is always used for significant impact analysis

^e Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

^f Never expected to be exceeded in any calendar year

^g Concentration at any modeled receptor

^h Never expected to be exceeded more than once in any calendar year

ⁱ Concentration at any modeled receptor when using five years of meteorological data

^j Not to be exceeded more than once per year

New source review requirements for assuring compliance with PM_{2.5} standards have not yet been developed. EPA has asserted through a policy memorandum that compliance with PM_{2.5} standards will be assured through an air quality analysis for the corresponding PM₁₀ standard. Although the PM₁₀ annual standard was revoked in 2006, compliance with the revoked PM₁₀ annual standard must be demonstrated as a surrogate to the annual PM_{2.5} standard.

2.1.3 TAPs Analyses

The emissions from the proposed project are required to demonstrate compliance with the toxic air pollutant (TAP) increments, with an ambient impact dispersion analysis for any TAP with a requested potential emission rate that exceeds the screening emission rate limit (EL) specified by IDAPA 58.01.01.585 or 58.01.01.586.

This project is for a new portable facility. The analyses submitted in this application included a project-specific

TAPs compliance demonstration per the requirements of IDAPA 58.01.01.210.

2.2 Background Concentrations

Ambient background concentrations were not used for this project. Maximum predicted ambient impacts for all criteria air pollutants were below significant contribution levels. A full ambient impact analysis was not required.

3.0 MODELING IMPACT ASSESSMENT

3.1 Modeling Methodology

Table 3 provides a summary of the modeling parameters used in the submitted modeling analyses.

<i>Parameter</i>	<i>Description/ Values</i>	<i>Documentation/Additional Description</i>
Model	SCREEN3	SCREEN3, Version 96043
Meteorological data	Full meteorology	Worst-case SCREEN3 meteorology was used.
Land Use (urban or rural)	Rural	Urban heat rise coefficients were not used. Urban heat rise coefficients for operations in Idaho are only appropriate in downtown Boise within the state of Idaho. This source is not anticipated to operate in downtown Boise.
Terrain	Not considered	Flat terrain was assumed by FRS. Evaluation of complex terrain would require either knowledge of complex terrain elevations for a specific location or the use of an assumed complex terrain layout. DEQ is approving the use of flat terrain analyses for this portable source.
Building downwash	Downwash algorithm	No buildings or structures were included in the modeling demonstration. Downwash effects were not analyzed.
Receptor grid	Grid 1	Receptors were used starting from a distance of 1 meter to 50,000 meters extending in all directions from the emissions source.

3.1.1 Modeling protocol

A modeling protocol was not submitted to DEQ by Bison Engineering, on behalf of FRS.

3.1.2 Model Selection

SCREEN3 was used by FRS to conduct the ambient air analyses. SCREEN3 is an adequate model for this project because the facility consists of a single point source. Building-induced downwash effects are not of concern for this project.

3.1.3 Meteorological Data

FRS used the full meteorology option. All atmospheric stability classes and wind speeds are applied with the selection of full meteorology.

3.1.4 Terrain Effects

The modeling analyses conducted by FRS did not consider elevated terrain. The modeling demonstration assumed operation of the portable incinerator in flat terrain conditions. Simple elevated terrain and complex terrain conditions were not evaluated in the submitted modeling demonstration.

3.1.5 Facility Layout

No facility layout plot plans were provided with the permit application. It is assumed that this emissions unit will be brought onto various sites for the purpose of woodwaste disposal.

3.1.6 Building Downwash

Plume downwash effects caused by structures present at any location the portable incinerator unit will be located were not accounted for in the modeling analyses.

3.1.7 Ambient Air Boundary

Ambient air was determined to exist for all areas immediately exterior to the emission unit. This is the worst-case assumption for establishing an ambient air boundary and meets the requirements specified in the *State of Idaho Air Quality Modeling Guideline*.

3.1.8 Receptor Network

The receptor locations used by FRS met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. The receptor grid is actually a continuous plume centerline downwind evaluation generated by SCREEN3, designed to resolve the maximum modeled ambient impacts.

3.2 Emission Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application. The following approach was used for DEQ modeling:

- All modeled criteria air pollutant and TAP emissions rates were equal to or greater than the facility's emissions calculated in the PTC application or requested permit allowable emission rates.

The short-term emission rates listed in Table 4 were modeled for 24 hours per day at maximum rated capacity of 6 tons of woodwaste per hour and operation of the diesel-fired engine at 59 horsepower. Emissions from the engine and the incinerator firebox were assumed to be emitted from the firebox, and emission rates listed in Tables 4 and 5 represent combined emissions from these two emissions units.

Source ID	Description	Emission Rates (lb/hr ^a)		
		PM ₁₀ ^b	SO ₂ ^c , 3-hr avg and 24-hr avg	CO ^d , 1-hr avg and 8-hr avg
FIREBOX	Air curtain incinerator exhaust and air blower system diesel-fired engine	1.03 (1.33) ^e	0.72	8.20

^a Pounds per hour

^b Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers, 24-hour averaging period

^c Sulfur dioxide

^d Carbon monoxide

^e Emission rate in parentheses was altered per request of permit writer. Incinerator firebox PM₁₀ emission rate was assumed to be equal to the PM emission rate of 1.2 lb/hr. Diesel engine for firebox airflow was calculated to be 0.13 lb/hr of PM₁₀. Combined emissions representing a single emission point equal 1.33 lb PM₁₀/hr.

Annual emissions are listed in Table 5. Annual operating hours were limited to 4,100 hours per year at maximum rated capacity.

Source ID	Description	Emission Rates ^a (lb/hr ^b)		
		PM ₁₀ ^c	SO ₂ ^d	NO ₂ ^e
FIREBOX	Air curtain incinerator exhaust and air blower system diesel-fired engine	0.48 (0.62) ^f	0.34	1.98

^a Maximum hourly emission rates multiplied by (4,100 hours per year / 8,760 hours per year)

^b Pounds per hour

^c Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

^d Sulfur dioxide

^e Nitrogen dioxide

^f Value in parentheses represents the final emission rate modeled by DEQ based on permit writer review which indicated that PM10 emissions equal PM emissions for the woodwaste incinerator. See Table 4, subscript "e" above.

The toxic air pollutant (TAP) emission rates listed below in Table 6 were modeled for 24 hours per day for non-carcinogenic TAPs. Carcinogenic TAPs emission rates reflect maximum hourly emission unit capacities and were scaled to 4,100 hours per year. TAPs were emitted from the incinerator firebox and consist of incinerator emissions alone, or the combined emissions from the incinerator and diesel-fired engine, as appropriate.

Pollutant	Averaging Period	Emission Rate (lb/hr) ^a
Non-carcinogenic TAPs		
Hydrogen Chloride	24-hour	1.03
Manganese	24-hour	7.56E-02
Carcinogenic TAPs		
Acetaldehyde	Annual	5.51E-03
Arsenic	Annual	2.40E-04
Benzene	Annual	1.06E-01
1, 3-Butadiene	Annual	1.42E-04
Cadmium	Annual	5.95E-05
Carbon tetrachloride	Annual	1.14E-03
Chloroform	Annual	7.08E-04
Chromium (+6)	Annual	1.29E-04
Formaldehyde	Annual	2.32E-02
Nickel	Annual	1.94E-04

^a Pounds per hour

3.3 Emission Release Parameters

Table 7 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for this point source. Values used in the analyses appeared reasonable and within expected ranges for the assumptions used in the submitted analyses. Emission release parameters were supported by

documentation based on performance testing and manufacturer data.

Release Point	Description	Stack Height (m)^a	Modeled Stack Diameter (m)	Stack Gas Flow Temperature (K)^b	Stack Gas Flow Velocity (m/sec)^c
FIREBOX	Air curtain incinerator exhaust and air blower system diesel-fired engine	2.134	3.81 ^d	418.15	2.59

^a Meters

^b Kelvin

^c Meters per second

^d Equivalent stack diameter based on the 1.9 meter by 6 meter firebox dimensions

3.4 Results for Ambient Impact Analyses

3.4.1 Significant Impact Analyses

A significant contribution analysis was submitted with this application. FRS performed the analysis to determine whether the worst-case impact for criteria air pollutants exceeded the significant contribution levels specified in IDAPA 58.01.01.006.102. A full impact analysis is not required if the impacts in the significant impact analyses are less than the significant contribution levels. The requested emissions and their associated worst-case ambient impacts did not exceed the significant contribution levels and a full impact analysis was not conducted.

The results of the significant contribution impact analysis are listed in Table 8.

Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m³)^a	Significant Impact Level (µg/m³)	Full Impact Analysis Required
PM ₁₀ ^b	24-hour	2.05 (2.65) ^c	5.0	No
	Annual	0.19 (0.25) ^c	1.0	No
Sulfur Dioxide (SO ₂)	3-hour	3.25	25	No
	24-hour	1.44	5	No
	Annual	0.29	1.0	No
Carbon Monoxide (CO)	1-hour	40.86	2,000	No
	8-hour	28.60	500	No
Nitrogen Dioxide (NO ₂)	Annual	0.79	1.0	No

^a Micrograms per cubic meter.

^b Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

^c Ambient impacts listed in parentheses are based on revised PM₁₀ emission rate.

Compliance with the applicable NAAQS was demonstrated by FRS. Ambient impacts of criteria air pollutants did not exceed SCLs for any pollutant and averaging period.

3.4.2 Toxic Air Pollutant Impact Analyses

Modeling for TAPs was required to demonstrate compliance with the TAP increments specified by IDAPA 58.01.01.585 and 586. The results of the TAPs analyses are listed in Table 9.

Table 9. RESULTS OF TAPs ANALYSES

Toxic Air Pollutant	Averaging Period	Maximum Modeled Concentration (ug/m ³) ^a	AAC/AACC ^b (ug/m ³)	Percent of AAC/AACC
Non-carcinogenic TAPs				
Hydrogen Chloride	24-hour	5.12	375	1.4%
Manganese	24-hour	3.77E-01	50	0.8%
Carcinogenic TAPs				
Acetaldehyde	Annual	3.43E-03	4.50E-01	0.8%
Arsenic	Annual	1.49E-04	2.30E-04	64.8%
Benzene	Annual	6.62E-02	1.20E-01	55.2%
1, 3-Butadiene	Annual	8.85E-05	3.60E-03	2.5%
Cadmium	Annual	3.71E-05	5.60E-04	6.6%
Carbon tetrachloride	Annual	7.09E-04	6.70E-02	1.1%
Chloroform	Annual	4.41E-04	4.30E-02	1.0%
Chromium (+6)	Annual	8.05E-05	8.30E-05	97.0%
Formaldehyde	Annual	1.45E-02	7.70E-02	18.8%
Nickel	Annual	9.66E-04	4.20E-03	23.0%

^a Micrograms per cubic meter

^b Acceptable ambient concentration for non-carcinogens/acceptable ambient concentration for carcinogens

4.0 CONCLUSIONS

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.

Appendix D – Facility Comments

1. **Facility comment:** Idaho DEQ requires a monthly Method 9 opacity test. Later on in Section 2.21, the federal regulations require only an initial and annual test. FRS believes the monthly test to be an excessive burden on its one- or two-man operation which will operate infrequently in Idaho. FRS requests that the permit language in Section 2.12 be changed to read, "Every 30 operating days, during daylight hours and under normal operating conditions, the permittee shall perform a Method 9 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625." This gives DEQ an ongoing assurance of compliance, without requiring a test when the air curtain incinerator may not be operating.

DEQ response: The comment is addressed in Permit Condition 2.12.

2. **Facility comment:** FRS would also like to point out that since this air curtain incinerator is portable and is also permitted in Montana, the initial and annual Method 9 opacity tests may be performed outside of Idaho. FRS will still notify Idaho DEQ 30 days in advance of the test and provide a written report of the results within 60 days after the test.

DEQ response: Yes, that would be fine if the test is conducted in another state as long as the results are submitted to DEQ for review.

3. **Facility comment:** Permit Condition 2.13.1 requires FRS to obtain documentation of sulfur content of diesel from a fuel supplier. Since FRS will only combust relatively small quantities of fuel, FRS will not be purchasing fuel from a distributor, but from a retail fuel station. FRS does not believe the average gas station attendant will be able to provide a receipt or any official documentation stating the sulfur content of diesel fuel purchased. FRS believes this requirement is unreasonable for such a small source. FRS proposes to retain the receipts of fuel purchased, and make a note of the percent sulfur content as noted on the pump labeling. FRS also notes that NSPS Subpart IIII does not include any documentation requirements for fuel sulfur content.

DEQ response: The comment is addressed in Permit Condition 2.13.1.

4. **Facility comment:** The permit describes the federal rules regarding performance testing of the air curtain incinerator. FRS would like to point out that IDAPA58.01.01.157(03) requires a 15-day notice for testing, whereas the federal New Source Performance Standards (NSPS) prescribe a 30-day notice. Since the federal regulations supersede the state regulations and contain a longer notice period, a 30-day notice will be required. In this case, following the federal rules will satisfy the demands from Idaho as well.

DEQ response: Agree.

5. **Facility comment:** This comment addresses the applicability of 40 CFR 60.4211(b)(1) through (b)(5), which deals with demonstration of compliance with emissions standards for the 59-hp diesel engine. Part (b)(4) would not be applicable, because the 59-hp diesel engine does not have any control device. Part (b)(5) is applicable, a stack test possibly could be performed. FRS intends to comply with 40 CFR 60.4211(b) by using part (b)(1), purchasing certified engine from the manufacturer, and maintaining documentation of that certification.

DEQ response: The comment is addressed in Permit Condition 2.29.